

REMARKS

The claims were rejected under 35 USC 103(a) as being obvious over Holenka in view of Mathis. Favorable reconsideration of this application is requested in view of the above amendments and the following remarks.

103 Rejection

The claims have been rejected based on a combination of Holenka and Mathis. Holenka is cited as teaching a suitable while drilling tool for making density and PEF measurements of a earth formation surrounding a borehole. Mathis is cited for the very general teaching that a tool can make both formation measurements and mud measurements. Applicants' respectfully assert that the combination of Holenka and Mathis is improper for the stated teaching. Further, even if a proper combination is conceded, the resultant combination is not suggestive of Applicants', now amended, claimed measurement technique.

Combination fails to obviate

The cited references of Holenka and Mathis, either alone or in combination, do not teach or suggest Applicant amended claims reciting detecting "cuttings buildup or a kick condition based on a comparison between said density measurements associated with at least two segments of said borehole," (claims 1 and 10) or "a comparison of the average PEF and either a known PEF of said mud mixture or at least one of a previously determined average PEF, " (claim 15). Specifically, Holenka is directed to formation measurements and does not mention cuttings buildup or kick conditions. Further, even if Mathis is properly combined with Holenka, to which Applicant's respectfully disagree, Mathis suggests only the generic teaching that mud measurements are possible. Mathis does not teach or suggest any specific mud measurements, such as those necessary to determine cuttings buildup or kick conditions. Furthermore, neither reference teaches or suggests Applicant's claimed manner of detecting cuttings or kicks based on density differences in an upper and lower segment (new claims 24 and 25) nor based on lower PEF readings compared to know PEF values or previous PEF measurements (new claims 26 and 27).

Improper Combination

Applicants' first note that the tools disclosed in Holenka and Mathis are very different. This fact is relevant to the question of whether one skilled in the art would consider combining

the two references, whether there is a suggestion or motivation to combine and whether Mathis is non-analogous art. MPEP 2143.01 and 2141.01(a). Holenka and Applicant's invention is a while drilling tool that is rotated during measurement cycles to obtain azimuthal images of the formation. Mathis is a wireline tool that makes measurements in a single direction in front of the tool. In the normal case, the tool is pressed against the formation by a spring device. In other cases, the back face of the tool is purported to rest against the borehole such that the front face is in contact with the mud rather than the formation. In either case, Mathis makes no provision for tool rotation.

In addition to different tool configurations, the measurement techniques of Holenka and Mathis are also very different. Here again, the point is relevant to a determination of whether there is a suggestion or motivation to combine and whether Mathis is non-analogous art. MPEP 2143.01 and 2141.01(a). Holenka and Applicant's invention is by design configured to make measurements circumferentially about the borehole axis. Holenka and Applicant's invention discloses a specific segmenting process that is a function of angular position. Holenka and Applicant's invention associates measurements at different angular position to obtain a set of measurements that define azimuthal characteristics of the formation at a particular depth. Mathis is simply non-analogous for these type of azimuthal measurements. Specifically, Mathis does not teach or suggest associating multiple downhole measurements in this manner. Thus, Mathis differs in both structure and function when compared to both Holenka and Applicant's invention. MPEP 2141.01(a). The Examiner states that the analogous aspects relate to the energy source and sensors of Holenka and Mathis. However, prior art references must be considered in their entirety, specifically including differences in overall structure and function, as stated above. MPEP 2141.01(a). For these reasons, Mathis is non-analogous art for purposes of the combination with Holenka and for the application of Mathis, in the first instance, to Applicant's claimed subject matter.

A person of ordinary skill would not consider the teaching of Mathis as being instructive to the teachings of Holenka. For at least this reason, there is no implicit suggestion that these two references should be combined for the claimed teaching. MPEP 2143.01. First, the tools or structure described in each reference, although both density tools, are directed to wholly different applications, Mathis to a wireline tool and Holenka to a drilling tool. Second, the measurement techniques or functions are wholly different. Thus, while Mathis mentions, in only one instance, that a tool may use spring-type standoffs for formation measurements or be without standoffs for mud measurements, there is no support for the position that this concept may be applied in a drilling environment. Further, any combination of the references relating to a common

measurement technique teaching fails due to the basic differences in the measurement techniques disclosed in each reference. For this reason, the suggested teaching of Mathis that formation measurements can directly be used for mud measurements also fails based on the stated differences in the structures/tools and functions/measurement techniques stated above. For at least these reasons, Applicants respectfully assert the combination of Holenka with Mathis for the stated teaching is improper.

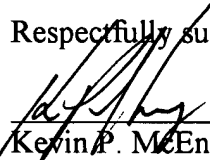
Finally, there is no explicit suggestion within Mathis that its teachings for wireline, uni-directional measurements can be applied to the while-drilling, azimuthal measurements of Holenka. Simply, there is no support for the inference in Mathis that all formation evaluation measurements may be applied to make any mud characteristic measurements. The type of mud measurements suggested by Mathis are limited to measurement techniques and measurement apparatus which Mathis employs for formation measurements. For these additional reasons, Applicant respectfully asserts that prima facie case of obviousness has not been established.

CONCLUSION

The Applicants believe this paper is fully responsive to each and every ground of rejection and objection cited by the Examiner and respectfully request reconsideration of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any applicable fees, or apply any excess, to deposit account number 19-0610.

Respectfully submitted,


Kevin P. McEnaney, Reg. No. 46,258

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Date

Schlumberger Technology Corporation
Office of Patent Counsel
200 Gillingham Lane, MD 200-9
Sugar Land, TX 77478
Telephone: 281-285-7325
Facsimile: 281-285-4232